

BRIEF ARTICLE

Bilateral Nodules on the Thighs: A Case Report on Insulin Therapy-Induced Palisaded Granulomas

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ABSTRACT

As the incidence and prevalence of diabetes mellitus is increasing, more cases of dermatologic complications attributed to therapy are being reported. Injection site reactions, most commonly erythema, edema and induration, lipo hypertrophy, and lipoatrophy have been associated with subcutaneous insulin therapy. Accurate diagnosis is important to guide clinical management and to ensure appropriate blood glucose control. Herein, we present an unusual case of bilateral nodules on the thighs secondary to insulin injections.

INTRODUCTION

As the incidence and prevalence of diabetes mellitus is increasing, more cases of dermatologic complications attributed to therapy are being reported. Lipoatrophy, lipo hypertrophy and injection site reactions, most commonly erythema, edema and induration, have been associated with subcutaneous insulin therapy^{1,2}. Available literature indicates that for some patients, insulin absorption can be abnormal if it is administered into the altered tissue¹. Therefore, an accurate diagnosis is important to guide clinical management. Herein, we present an unusual case of bilateral nodules on the thighs secondary to insulin injections.

CASE REPORT

A 90-year-old female presented with a 14-year history of slowly enlarging pruritic

nodules located on her proximal lateral thighs where insulin injections were repeatedly administered. Past medical history is significant for diabetes mellitus type 2 managed with twice daily insulin Detemir and Aspart. Physical exam revealed bilateral edematous, mobile, 8 x 10-cm nodules with central induration, hyperpigmentation and lichenification (Figure 1).

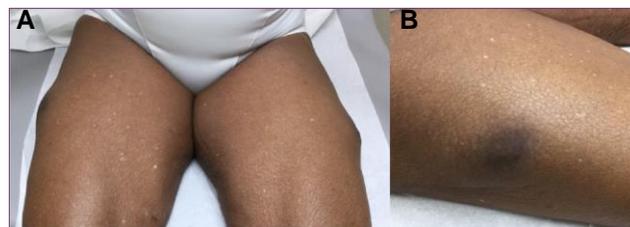


Figure 1. A) Soft, mobile nodules on both proximal, lateral thighs. **B)** 8 x 10-cm soft, mobile nodule with overlying hyperpigmentation and lichenification.

The patient only injected insulin into the two sites and did not inject at any other site. The lesions had not previously been treated. The patient otherwise felt well and denied

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experiencing fevers, sweats, chills, weight loss, or malaise. A 4mm punch biopsy was performed on the right lateral thigh for further evaluation. Histopathologic evaluation revealed a patchy dense inflammatory infiltrate composed of lymphocytes, plasma cells, eosinophils and irregular aggregates of mono- and multinucleated histiocytes surrounding areas of degenerated hyalinized collagen bundles. This process involved the full thickness of the dermis (Figure 2).

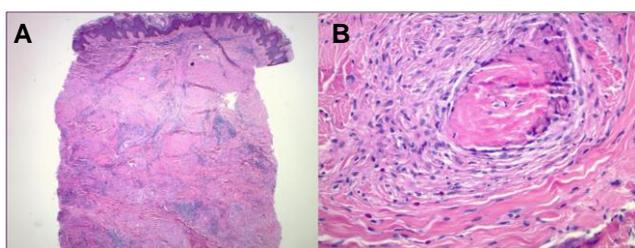


Figure 2. A) Hematoxylin-eosin-stained sections reveal a patchy dense inflammatory infiltrate throughout the dermis **B)** High-power magnification revealed a mixed infiltrate with areas of degenerated hyalinized collagen bundles surrounded by mono- and multinucleated histiocytes.

The epidermis showed slight acanthosis and compact orthokeratosis. Special stains for fungi and acid fast organisms (PAS and Fite) were negative for organisms. Amyloid stains (Congo red and Crystal violet) were also negative. There were no abnormalities in size or morphology of the adipocytes, and no foreign bodies were identified on polarized light microscopy. In view of the clinical history and histopathologic findings, the patient was diagnosed with a palisaded granulomatous reaction induced by insulin injections. At the follow up appointment after rotating multiple other injection sites, she has not developed any other granulomas.

DISCUSSION

More cases of dermatologic complications attributed to insulin therapy are being

reported with the concurrent increase in diabetes mellitus^{1,2}. The most common complications secondary to insulin injection are erythema, edema, and induration. Uncommon complications are lipohypertrophy, and lipoatrophy. Rare injection-site complications include insulin-derived amyloidosis, systemic allergic reaction, non-palisaded granulomas and suppurative granulomas³⁻⁵. One case in the literature reports a foreign body reaction to insulin with a palisaded granulomatous dermatitis².

Clinically, the main diagnoses to consider in the differential of insulin-induced palisaded granuloma are insulin-induced nodular amyloidosis and insulin-induced lipohypertrophy^{5,6}. Histologically, nodular amyloidosis will demonstrate eosinophilic material, fibrosis, scattered inflammatory cells and will stain positive for Congo red. Lipohypertrophy will display mature adipocytes with lipid droplets and fibrosis^{2,5}. A number of dermatologic conditions have been related to diabetes mellitus or as a consequence of therapies used in the treatment of diabetes. Educating patients on how to prevent potential treatment-related complications is important as there are limited treatment options. Understanding the various cutaneous adverse effects of insulin therapy is also important since insulin absorption from abnormal tissue can alter absorption and lead to difficulties in achieving appropriate blood glucose control^{6,7}. Therefore, accurate diagnosis is important to guide clinical management which includes careful monitoring of blood glucose levels and rotating injection sites. As the incidence of insulin-induced granulomas is rare, there is minimal literature addressing treatment for early and late presentations. Due to the dermal and subcutaneous localization of the pathology, topical steroids and steroid-sparing agents

would likely be ineffective for treatment. If the patient refuses to rotate injection sites, surgical excision should be considered for optimal glucose absorption or if immediate cosmesis is sought⁵⁻⁷.

CONCLUSION

With the increase in diabetes mellitus, there is a concurrent increase in cutaneous complications related to diabetes mellitus treatment. Cutaneous complications from insulin therapy can have important ramifications for cosmesis and, most importantly, glycemic control. Accurate diagnosis, judicious blood glucose monitoring and patient education are paramount.

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